

Fact Sheet

Defense Threat Reduction Agency



Operation ARGUS

Note: For information related to claims, call the Department of Veterans Affairs (VA) at 800-827-1000 or the Department of Justice (DOJ) at 800-729-7327. For all other information, call the Nuclear Test Personnel Review (NTPR) Program Helpline at 800-462-3683.

Operation ARGUS was the designation given to the three high-altitude nuclear test shots conducted by the United States in the South Atlantic Ocean from August 27 to September 10, 1958. The ARGUS shots were conducted to test the Christofilos theory, which argued that high-altitude nuclear detonations would create a radiation belt in the upper regions of the Earth's atmosphere. It was theorized that the radiation belt would have military implications, including degradation of radio and radar transmissions, damage or destruction of the arming and fuzing mechanisms of ICBM warheads, and endangering the crews of orbiting space vehicles that might enter the belt.

Historical Background

The tests were conducted in complete secrecy and were not announced until the following year. The organization conducting these tests was Task Force 88, a naval organization consisting of 9 ships and approximately 4,500 men. A few specialists from the other services and the Atomic Energy Commission and their contractors were with the fleet. Coordinated measurement programs using satellite, rocket, aircraft, and surface stations were carried out by the services and other government agencies and contractors throughout the world. The ships of Task Force 88 were the antisubmarine warfare support aircraft carrier USS TARAWA (CVS 40), the destroyers USS BEARSS (DD 654) and USS WARRINGTON (DD 843), the destroyer escorts USS COURTNEY (DE 1021) and USS HAMMERBERG (DE 1015), the fleet oilers USS NEOSHO (AO 143) and USS SALAMONIE (AO 26), the missile trials ship USS NORTON SOUND (AVM 1), and the seaplane tender USS ALBEMARLE (AV 5).

The low-yield (1 to 2 kiloton) devices were lifted to about a 300-mile altitude by rockets fired from the ship, USS NORTON SOUND. The detonations occurred at such distances above the Earth that there was no possibility of exposure of task force personnel to ionizing radiation.

The results of the ARGUS operation proved the validity of the Christofilos theory. The establishment of an electron shell derived from neutron and beta decay of fission products and ionization of device materials in the upper fringe of the atmosphere was demonstrated. The operation not only provided data on military considerations but also produced a great mass of geophysical data, pure scientific material of great value.

Radiation Doses at Operation ARGUS

Records indicate that 4,000 film badges were procured and stowed on board task force ships, as were alpha radiation sensors. Only 264 of the film badges were actually used. They were mounted on the ships' superstructures, worn by the pilots of the four observer planes, and used by the individuals who handled the warhead on USS NORTON SOUND. The actual film badges and dose records were lost (along with many of

the other records of this secret operation), but a summary was found in a post-operation report. Of the 264 film badges distributed to the task force, the highest reading was 0.010 rem*, which was below the detection limit for the film type used. The highest recorded film reading, 0.025 rem, was by a control film packet placed in a radiation-free area within one of the ships. The dosimetry program confirmed that ARGUS personnel did not receive radiation doses from their participation in the operation.

For more information, see the report "Operation ARGUS 1958" (DNA 6039F), available online at <https://www.dtra.mil/DTRA-Mission/Reference-Documents/NTPR-Info/>.

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* A rem is a radiation protection unit of measure that quantifies the risk of biological effects resulting from exposure to ionizing radiation. Ionizing radiation is any radiation (gamma, x-ray, beta, neutron, or alpha) capable of displacing electrons from atoms or molecules, thereby producing ions. According to the National Council on Radiation Protection and Measurements (NCRP, Report No. 160, Table 1.1), the general U.S. population receives about 0.62 rem per year from natural background radiation sources (radon, cosmic rays, and rocks) and man-made radiation sources (medical diagnostic x-rays and consumer products). As a basis of comparison, a standard diagnostic chest x-ray delivers a radiation dose of about 0.02 rem.